

## SEQUENCE LISTING

<110> Collins, Mary et al.

<120> ANTIBODIES AGAINST PD-1 AND USES THEREFOR

<130> 08702.6098-00000

<160> 58

<170> PatentIn version 3.1

<210> 1

<211> 384

<212> DNA

<213> Homo sapiens

<400> 1

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tggagttggg tccgccagtc cccagggaag gggctggagt ggataggcga aatctatcat 180  
agtgggagca ccaactacaa cccgtccctc aagagtcgcg tcaccatata actagacaag 240  
tctaggaata acttctccct gaggctgaac tctgtgaccg ccgcggacac ggccgtttat 300  
tactgtgcga gacaggacta cggtgactcc ggcgactggg acttcgatct gtggggcaag 360  
gggacaatgg tcaccgtctc ctca 384

<210> 2

<211> 128

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 2

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Val Val Lys Pro Ser Gly  
 1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Ile Ser Gly Gly Ser Ile Gly Ser Gly  
 20 25 30

Gly Ser Ile Arg Ser Thr Arg Trp Trp Ser Trp Val Arg Gln Ser Pro  
 35 40 45

Gly Lys Gly Leu Glu Trp Ile Gly Glu Ile Tyr His Ser Gly Ser Thr  
 50 55 60

Asn Tyr Asn Pro Ser Leu Lys Ser Arg Val Thr Ile Ser Leu Asp Lys  
 65 70 75 80

Ser Arg Asn His Phe Ser Leu Arg Leu Asn Ser Val Thr Ala Ala Asp  
 85 90 95

Thr Ala Val Tyr Tyr Cys Ala Arg Gln Asp Tyr Gly Asp Ser Gly Asp  
 100 105 110

Trp Tyr Phe Asp Leu Trp Gly Lys Gly Thr Met Val Thr Val Ser Ser  
 115 120 125

&lt;210&gt; 3

&lt;211&gt; 330

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 3

aattttatgc tgactcagcc ccactctgtg tcggagtctc cggggaagac ggtaaccatc 60  
tcctgcaccc gcagcagtgg cagcattgcc agcaactctg tgcagtggta ccagcagcgc 120  
ccgggcagtt cccccaccac tgtgatctat gaggataacc aaagaccctc tggggtcctt 180  
gatcggttct ctggctccat cgacagctcc tccaactctg cctccctcac cgtctctgga 240  
ctgaagactg aggacgaggc tgactactac tgtcagtctt ctgatagcag cgctgtggta 300  
ttcggcagtg ggaccaagct gaccgtccta 330

&lt;210&gt; 4

&lt;211&gt; 110

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens.

&lt;400&gt; 4

Asn Phe Met Leu Thr Gln Pro His Ser Val Ser Glu Ser Pro Gly Lys  
1 5 10 15

Thr Val Thr Ile Ser Cys Thr Arg Ser Ser Gly Ser Ile Ala Ser Asn  
20 25 30

Ser Val Gln Trp Tyr Gln Gln Arg Pro Gly Ser Ser Pro Thr Thr Val  
35 40 45

Ile Tyr Glu Asp Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser  
50 55 60

Gly Ser Ile Asp Ser Ser Ser Asn Ser Ala Ser Leu Thr Val Ser Gly  
 65 70 75 80

Leu Lys Thr Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Ser Asp Ser  
 85 90 95

Ser Ala Val Val Phe Gly Ser Gly Thr Lys Leu Thr Val Leu  
 100 105 110

<210> 5

<211> 357

<212> DNA

<213> Homo sapiens

<400> 5

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 cctggacaag ggcttgagtg gatgggatgg atcagcgctt acaatggtaa cacaaactac 180  
 gcacagaagc tccagggcag agtcaccatg accacagaca catccacgaa cacagcctac 240  
 atggagctga ggagcctgag atctgacgac acggccgtgt attactgtgc gagagacgcg 300  
 gattatagta gtgggtctgg gtactggggc caggggaaccc tggtcaccgt ctctctca 357

<210> 6

<211> 119

<212> PRT

<213> Homo sapiens

<400> 6

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Arg Phe Thr Ser Tyr  
 20 25 30

Gly Ile Ser Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Ala Tyr Asn Gly Asn Thr Asn Tyr Ala Gln Lys Leu  
 50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Thr Ser Thr Asn Thr Ala Tyr  
 65 70 75 80

Met Glu Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Asp Ala Asp Tyr Ser Ser Gly Ser Gly Tyr Trp Gly Gln Gly  
 100 105 110

Thr Leu Val Thr Val Ser Ser  
 115

<210> 7

<211> 324

<212> DNA

<213> Homo sapiens

<400> 7

tcctatgagc tgactcagcc accctcggtg tcagtgtccc caggacagac ggccaggatc 60

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caggcccctg tgatgggttat atataaagac actgagaggc cctcagggat ccctgagcga 180  
 ttctctggct ccagctcagg gacaaaagtc acgttgacca tcagtggagt ccaggcagaa 240  
 gacgaggctg actattattg tcaatcagca gacaacagta ttacttatag ggtgttcggc 300  
 ggagggacca aggtcacctg ccta 324

<210> 8  
 <211> 108  
 <212> PRT  
 <213> Homo sapiens

<400> 8

Ser Tyr Glu Leu Thr Gln Pro Pro Ser Val Ser Val Ser Pro Gly Gln  
 1 5 10 15

Thr Ala Arg Ile Thr Cys Ser Gly Asp Ala Leu Pro Lys Gln Tyr Ala  
 20 25 30

Tyr Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Met Val Ile Tyr  
 35 40 45

Lys Asp Thr Glu Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser  
 50 55 60

Ser Ser Gly Thr Lys Val Thr Leu Thr Ile Ser Gly Val Gln Ala Glu  
 65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Ala Asp Asn Ser Ile Thr Tyr  
 85 90 95

Arg Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu  
 100 105

<210> 9  
 <211> 357  
 <212> DNA  
 <213> Homo sapiens

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 tcctgcaagg catctggata caccctcacc agttactata ttcactgggt gcgacaggcc 120  
 cctggacaag ggcttgagtg gatgggaata atcaacccta gaggtgccac cataagctac 180  
 gcacagaagt tccagggcag agtcaccatg accagggaca cgtccacgag tacagtctac 240  
 atggaactga gaaacttgaa atctgaggac acggccctgt attactgtgc tactgcaggc 300  
 atctatgggtt ttgactttga ctactggggc agaggaaccc tggtcaccgt ctctca 357

<210> 10  
 <211> 119  
 <212> PRT  
 <213> Homo sapiens

<400> 10

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Thr Leu Thr Ser Tyr  
 20 25 30

Tyr Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Asn Pro Arg Gly Ala Thr Ile Ser Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr  
 65 70 75 80

Met Glu Leu Arg Asn Leu Lys Ser Glu Asp Thr Ala Leu Tyr Tyr Cys  
 85 90 95

Ala Thr Ala Gly Ile Tyr Gly Phe Asp Phe Asp Tyr Trp Gly Arg Gly  
 100 105 110

Thr Leu Val Thr Val Ser Ser  
 115

<210> 11

<211> 333

<212> DNA

<213> Homo sapiens

<400> 11

cagtctgccc tgactcagcc tgcctccgtg tctgggtctc ctgggcagtc gatcaccatc 60

tcctgcactg gaaccagtaa tgacgttggt gggtataatt atgtctcctg gtaccaacat 120

caccaggca aagcccccaa actcatcatt tatgatgtca ctaaccggcc ctgaggggtt 180

tctgatcgt tctctggctc caagtctggc aacacggcct ccctgaccat ctctgggctc 240

ctggctgagg acgaggggtga ttattactgc agctcataca caattgttac caatttcgag 300



gttctttttcg gcggagggac caagctgacc gtc

333

<210> 12

<211> 111

<212> PRT

<213> Homo sapiens

<400> 12

Gln Ser Ala Leu Thr Gln Pro Ala Ser Val Ser Gly Ser Pro Gly Gln  
1 5 10 15

Ser Ile Thr Ile Ser Cys Thr Gly Thr Ser Asn Asp Val Gly Gly Tyr  
20 25 30

Asn Tyr Val Ser Trp Tyr Gln His His Pro Gly Lys Ala Pro Lys Leu  
35 40 45

Ile Ile Tyr Asp Val Thr Asn Arg Pro Ser Gly Val Ser Asp Arg Phe  
50 55 60

Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu Thr Ile Ser Gly Leu  
65 70 75 80

Leu Ala Glu Asp Glu Gly Asp Tyr Tyr Cys Ser Ser Tyr Thr Ile Val  
85 90 95

Thr Asn Phe Glu Val Leu Phe Gly Gly Gly Thr Lys Leu Thr Val  
100 105 110

&lt;210&gt; 13

&lt;211&gt; 381

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 13

cagggtgcagc tgcaggagtc gggcccagga ctggtgaagc cttcacagac cctgtccctc 60  
 acctgcactg tctctggtgg ctccatcagc agtggtgctt attactggag ctggatccgc 120  
 cagcaccacag ggaagggcct ggagtggatt gggtagatct attacaatgg gaacacgtac 180  
 tacaaccctg ccctcaggag tctagttacc atatcagtag acgcgtctaa gaaccagttc 240  
 tccctgaagc tgagctctgt gactgccgcg gacacggccg tctattactg tgcgagagcg 300  
 tctgattacg tttggggggg ttatcgttat atggatgctt ttgatatctg gggccgggga 360  
 accctggtca cctgtctctc a 381

&lt;210&gt; 14

&lt;211&gt; 127

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 14

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Gln  
 1 5 10 15

Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Gly Ser Ile Ser Ser Gly  
 20 25 30

Ala Tyr Tyr Trp Ser Trp Ile Arg Gln His Pro Gly Lys Gly Leu Glu  
 35 40 45

Trp Ile Gly Tyr Ile Tyr Tyr Asn Gly Asn Thr Tyr Tyr Asn Pro Ser  
 50 55 60

Leu Arg Ser Leu Val Thr Ile Ser Val Asp Ala Ser Lys Asn Gln Phe  
 65 70 75 80

Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr  
 85 90 95

Cys Ala Arg Ala Ser Asp Tyr Val Trp Gly Gly Tyr Arg Tyr Met Asp  
 100 105 110

Ala Phe Asp Ile Trp Gly Arg Gly Thr Leu Ile Thr Val Ser Ser  
 115 120 125

<210> 15

<211> 336

<212> DNA

<213> Homo sapiens

<400> 15

cagtctgtgc tgactcagcc accctcagcg tctgggaccc ccgggcagag ggtcaccatc 60

tcttggttctg gaagcaactc caacatcgga agtaattctg taaactggta ccagcagctc 120

ccaggaacgg cccccaaact cctcatctat ggtaataatc agcggccctc aggggtccct 180

gaccgattct ctgggtccaa gtctggcacc tcagcctccc tggccatcag tgggctccag 240

tctgagaatg aggctgatta ttactgtgca gcatgggatg acagcctgaa tgggtccggta 300

ttcggcccgag ggaccaaggt caccgtccta ggtgag 336

<210> 16  
 <211> 112  
 <212> PRT  
 <213> Homo sapiens

<400> 16

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln  
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Asn Ser Asn Ile Gly Ser Asn  
 20 25 30

Ser Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu  
 35 40 45

Ile Tyr Gly Asn Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser  
 50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln  
 65 70 75 80

Ser Glu Asn Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu  
 85 90 95

Asn Gly Pro Val Phe Gly Arg Gly Thr Lys Val Thr Val Leu Gly Glu  
 100 105 110

<210> 17  
 <211> 12  
 <212> PRT

<213> Homo sapiens

<400> 17

Ser Gly Gly Ser Ile Arg Ser Thr Arg Trp Trp Ser  
1 5 10

<210> 18

<211> 16

<212> PRT

<213> Homo sapiens

<400> 18

Glu Ile Tyr His Ser Gly Ser Thr Asn Tyr Asn Pro Ser Leu Lys Ser  
1 5 10 15

<210> 19

<211> 13

<212> PRT

<213> Homo sapiens

<400> 19

Gln Asp Tyr Gly Asp Ser Gly Asp Trp Tyr Phe Asp Leu  
1 5 10

<210> 20

<211> 13

<212> PRT

<213> Homo sapiens

<400> 20

Thr Arg Ser Ser Gly Ser Ile Ala Ser Asn Ser Val Gln  
1 5 10

<210> 21  
<211> 7  
<212> PRT  
<213> Homo sapiens

<400> 21

Glu Asp Asn Gln Arg Pro Ser  
1 5

<210> 22  
<211> 9  
<212> PRT  
<213> Homo sapiens

<400> 22

Gln Ser Ser Asp Ser Ser Ala Val Val  
1 5

<210> 23  
<211> 5  
<212> PRT  
<213> Homo sapiens

<400> 23

Ser Tyr Gly Ile Ser  
1 5

<210> 24  
<211> 17  
<212> PRT

<213> Homo sapiens

<400> 24

Trp Ile Ser Ala Tyr Asn Gly Asn Thr Asn Tyr Ala Gln Lys Leu Gln  
1                      5                      10                      15

Gly

<210> 25

<211> 10

<212> PRT

<213> Homo sapiens

<400> 25

Asp Ala Asp Tyr Ser Ser Gly Ser Gly Tyr  
1                      5                      10

<210> 26

<211> 11

<212> PRT

<213> Homo sapiens

<400> 26

Ser Gly Asp Ala Leu Pro Lys Gln Tyr Ala Tyr  
1                      5                      10

<210> 27

<211> 7

<212> PRT

<213> Homo sapiens

<400> 27

Lys Asp Thr Glu Arg Pro Ser

1 5

<210> 28

<211> 11

<212> PRT

<213> Homo sapiens

<400> 28

Gln Ser Ala Asp Asn Ser Ile Thr Tyr Arg Val

1 5 10

<210> 29

<211> 5

<212> PRT

<213> Homo sapiens

<400> 29

Ser Tyr Tyr Ile His

1 5

<210> 30

<211> 17

<212> PRT

<213> Homo sapiens

<400> 30

Ile Ile Asn Pro Arg Gly Ala Thr Ile Ser Tyr Ala Gln Lys Phe Gln

1 5 10 15



Gly

<210> 31

<211> 10

<212> PRT

<213> Homo sapiens

<400> 31

Ala Gly Ile Tyr Gly Phe Asp Phe Asp Tyr  
1 5 10

<210> 32

<211> 14

<212> PRT

<213> Homo sapiens

<400> 32

Thr Gly Thr Ser Asn Asp Val Gly Gly Tyr Asn Tyr Val Ser  
1 5 10

<210> 33

<211> 7

<212> PRT

<213> Homo sapiens

<400> 33

Asp Val Thr Asn Arg Pro Ser  
1 5

<210> 34

<211> 12

<212> PRT

<213> Homo sapiens

<400> 34

Ser Ser Tyr Thr Ile Val Thr Asn Phe Glu Val Leu  
1 5 10

<210> 35

<211> 7

<212> PRT

<213> Homo sapiens

<400> 35

Ser Gly Ala Tyr Tyr Trp Ser  
1 5

<210> 36

<211> 16

<212> PRT

<213> Homo sapiens

<400> 36

Tyr Ile Tyr Tyr Asn Gly Asn Thr Tyr Tyr Asn Pro Ser Leu Arg Ser  
1 5 10 15

<210> 37

<211> 17

<212> PRT

<213> Homo sapiens

<400> 37

Ala Ser Asp Tyr Val Trp Gly Gly Tyr Arg Tyr Met Asp Ala Phe Asp  
1 5 10 15

Ile

<210> 38  
<211> 13  
<212> PRT  
<213> Homo sapiens

<400> 38

Ser Gly Ser Asn Ser Asn Ile Gly Ser Asn Ser Val Asn  
1 5 10

<210> 39  
<211> 7  
<212> PRT  
<213> Homo sapiens

<400> 39

Gly Asn Asn Gln Arg Pro Ser  
1 5

<210> 40  
<211> 11  
<212> PRT  
<213> Homo sapiens

<400> 40

Ala Ala Trp Asp Asp Ser Leu Asn Gly Pro Val  
1 5 10

<210> 41  
 <211> 288  
 <212> PRT  
 <213> Homo sapiens

<400> 41

Met Gln Ile Pro Gln Ala Pro Trp Pro Val Val Trp Ala Val Leu Gln  
 1 5 10 15

Leu Gly Trp Arg Pro Gly Trp Phe Leu Asp Ser Pro Asp Arg Pro Trp  
 20 25 30

Asn Pro Pro Thr Phe Phe Pro Ala Leu Leu Val Val Thr Glu Gly Asp  
 35 40 45

Asn Ala Thr Phe Thr Cys Ser Phe Ser Asn Thr Ser Glu Ser Phe Val  
 50 55 60

Leu Asn Trp Tyr Arg Met Ser Pro Ser Asn Gln Thr Asp Lys Leu Ala  
 65 70 75 80

Ala Phe Pro Glu Asp Arg Ser Gln Pro Gly Gln Asp Cys Arg Phe Arg  
 85 90 95

Val Thr Gln Leu Pro Asn Gly Arg Asp Phe His Met Ser Val Val Arg  
 100 105 110

Ala Arg Arg Asn Asp Ser Gly Thr Tyr Leu Cys Gly Ala Ile Ser Leu  
 115 120 125

Ala Pro Lys Ala Gln Ile Lys Glu Ser Leu Arg Ala Glu Leu Arg Val  
 130 135 140

Thr Glu Arg Arg Ala Glu Val Pro Thr Ala His Pro Ser Pro Ser Pro  
 145 150 155 160

Arg Pro Ala Gly Gln Phe Gln Thr Leu Val Val Gly Val Val Gly Gly  
 165 170 175

Leu Leu Gly Ser Leu Val Leu Leu Val Trp Val Leu Ala Val Ile Cys  
 180 185 190

Ser Arg Ala Ala Arg Gly Thr Ile Gly Ala Arg Arg Thr Gly Gln Pro  
 195 200 205

Leu Lys Glu Asp Pro Ser Ala Val Pro Val Phe Ser Val Asp Tyr Gly  
 210 215 220

Glu Leu Asp Phe Gln Trp Arg Glu Lys Thr Pro Glu Pro Pro Val Pro  
 225 230 235 240

Cys Val Pro Glu Gln Thr Glu Tyr Ala Thr Ile Val Phe Pro Ser Gly  
 245 250 255

Met Gly Thr Ser Ser Pro Ala Arg Arg Gly Ser Ala Asp Gly Pro Arg  
 260 265 270

Ser Ala Gln Pro Leu Arg Pro Glu Asp Gly His Cys Ser Trp Pro Leu  
 275 280 285

&lt;210&gt; 42

&lt;211&gt; 320

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 42

gtcagcccaa ggctgcccc tcggtcactc tgttcccgcc ctcctctgag gagcttcaag 60

ccaacaaggc cacactgggtg tgtctcataa gtgacttcta cccgggagcc gtgacagtgg 120

cctggaaggc agatagcagc cccgtcaagg cgggagtgga gaccaccaca ccctccaaac 180

aaagcaacaa caagtacgcg gccagcagct atctgagcct gacgcctgag cagtgggaagt 240

cccacagaag ctacagctgc caggtcacgc atgaaggag caccgtggag aagacagtgg 300

cccctacaga atgttcatag 320

&lt;210&gt; 43

&lt;211&gt; 106

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 43

Gly Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser  
 1 5 10 15

Glu Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp  
 20 25 30

Phe Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro  
 35 40 45

Val Lys Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn  
 50 55 60

Lys Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys  
 65 70 75 80

Ser His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val  
 85 90 95

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser  
 100 105

<210> 44

<211> 960

<212> DNA

<213> Homo sapiens

<400> 44

cctccaccaa gggcccatcg gtcttcccc tggcaccctc ctccaagagc acctctgggg 60  
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 ggaactcagg cgccctgacc agcggcgtgc acaccttccc ggctgtccta cagtcctcag 180  
 gactctactc cctcagcagc gtggtgaccg tgccctccag cagcttgggc acccagacct 240  
 acatctgcaa cgtgaatcac aagcccagca acaccaaggt ggacaagaaa gttgagccca 300  
 aatcttgtga caaaactcac acatgcccac cgtgcccagc acctgaactc ctgggggggac 360  
 cgtcagtctt cctcttcccc ccaaaaccca aggacaccct catgatctcc cggaccctg 420  
 aggtcacatg cgtggtggtg gacgtgagcc acgaagaccc tgaggtcaag ttcaactggt 480  
 acgtggacgg cgtggaggtg cataatgcca agacaaagcc gcgggaggag cagtacaaca 540  
 gcacgtaccg tgtggtcagc gtcctcaccg tcctgcacca ggactggctg aatggcaagg 600

agtacaagtg caaggtctcc aacaaagccc tcccagcccc catcgagaaa accatctcca 660  
 aagccaaagg gcagccccga gaaccacagg tgtacaccct gcccccatcc cgggaggaga 720  
 tgaccaagaa ccaggtcagc ctgacctgcc tggtaaagg cttctatccc agcgacatcg 780  
 ccgtggagtg ggagagcaat gggcagccgg agaacaacta caagaccacg cctcccgtgc 840  
 tggactccga cggctccttc ttctctata gcaagctcac cgtggacaag agcaggtggc 900  
 agcaggggaa cgtcttctca tgctccgtga tgcattgaggc tctgcacaac cactacacgc 960

<210> 45

<211> 330

<212> PRT

<213> Homo sapiens

<400> 45

Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys  
 1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr  
 20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser  
 35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser  
 50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr  
 65 70 75 80



Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys  
 85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys  
 100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro  
 115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys  
 130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp  
 145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu  
 165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu  
 180 185 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn  
 195 200 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly  
 210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu  
 225 230 235 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr  
 245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn  
 260 265 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe  
 275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn  
 290 295 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr  
 305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys  
 325 330

<210> 46

<211> 366

<212> DNA

<213> Homo sapiens

<400> 46

ggcgcgcact ccgaggtgca gctggtgcag tctgggggag gcgtgggttca gcctgggagg 60

tccctgagac tctcctgtgc agcgtctgga ttcaccttta gtagctattg gatgagctgg 120

gtccgccagg ctccagggaa ggggctggag tgggtctcag ctattagtgg tagtggtgggt 180

agcacatact acgcagactc cgtgaagggc cggttcacca tctccagaga caattccaag 240

aacacgctgt atctgcaa at gaacagccta agagccgagg acacggccgt atattactgt 300  
 gcgaaagaga actggggatc gtacttcgat ctctgggggc aagggaccac ggtcaccgtc 360  
 tcctca 366

<210> 47  
 <211> 125  
 <212> PRT  
 <213> Homo sapiens

<400> 47

Gly Ala His Ser Glu Val Gln Leu Val Gln Ser Gly Gly Gly Val Val  
 1 5 10 15

Gln Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr  
 20 25 30

Phe Ser Ser Tyr Trp Cys Asp Arg Met Ser Trp Val Arg Gln Ala Pro  
 35 40 45

Gly Lys Gly Leu Glu Trp Val Ser Ala Ile Ser Gly Ser Gly Gly Ser  
 50 55 60

Thr Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp  
 65 70 75 80

Asn Ser Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu  
 85 90 95

Asp Thr Ala Val Tyr Tyr Cys Ala Lys Glu Asn Trp Gly Ser Tyr Phe  
 100 105 110

Asp Leu Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser  
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<211> 332

<212> DNA

<213> Homo sapiens

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 cagcagaaac caggagagc ccctaaggtc ttgatctata aggcactctac tttagaaagt 180  
 ggggtcccat caaggttcag cggcagtgga tctgggacag atttcactct caccatcagc 240  
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<213> Homo sapiens

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Gly Val His Ser Asp Ile Val Met Thr Gln Ser Pro Ser Thr Leu Ser  
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Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Gly  
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Ile Ser Ser Trp Leu Ala Trp Tyr Gln Gln Lys Pro Gly Arg Ala Pro  
35 40 45

Lys Val Leu Ile Tyr Lys Ala Ser Thr Leu Glu Ser Gly Val Pro Ser  
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser  
65 70 75 80

Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Tyr  
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Ser Thr Pro Trp Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg  
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Gly

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Glu Asn Trp Gly Ser Tyr Phe Asp Leu  
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Gln Gln Ser Tyr Ser Thr Pro Trp Thr  
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Leu Ser Trp Gln Ser Gly Trp Leu Leu Glu Val Pro Asn Gly Pro Trp  
 20 25 30

Arg Ser Leu Thr Phe Tyr Pro Ala Trp Leu Thr Val Ser Glu Gly Ala  
 35 40 45

Asn Ala Thr Phe Thr Cys Ser Leu Ser Asn Trp Ser Glu Asp Leu Met  
 50 55 60

Leu Asn Trp Asn Arg Leu Ser Pro Ser Asn Gln Thr Glu Lys Gln Ala  
 65 70 75 80

Ala Phe Cys Asn Gly Leu Ser Gln Pro Val Gln Asp Ala Arg Phe Gln  
 85 90 95

Ile Ile Gln Leu Pro Asn Arg His Asp Phe His Met Asn Ile Leu Asp  
 100 105 110

Thr Arg Arg Asn Asp Ser Gly Ile Tyr Leu Cys Gly Ala Ile Ser Leu  
 115 120 125

His Pro Lys Ala Lys Ile Glu Glu Ser Pro Gly Ala Glu Leu Val Val  
 130 135 140

Thr Glu Arg Ile Leu Glu Thr Ser Thr Arg Tyr Pro Ser Pro Ser Pro  
 145 150 155 160

Lys Pro Glu Gly Arg Phe Gln Gly Met Val Ile Gly Ile Met Ser Ala  
 165 170 175

Leu Val Gly Ile Pro Val Leu Leu Leu Leu Ala Trp Ala Leu Ala Val  
 180 185 190

Phe Cys Ser Thr Ser Met Ser Glu Ala Arg Gly Ala Gly Ser Lys Asp  
 195 200 205

Asp Thr Leu Lys Glu Glu Pro Ser Ala Ala Pro Val Pro Ser Val Ala  
 210 215 220

Tyr Glu Glu Leu Asp Phe Gln Gly Arg Glu Lys Thr Pro Glu Leu Pro  
 225 230 235 240

Thr Ala Cys Val His Thr Glu Tyr Ala Thr Ile Val Phe Thr Glu Gly  
 245 250 255



Leu Gly Ala Ser Ala Met Gly Arg Arg Gly Ser Ala Asp Gly Leu Gln  
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Gly Pro Arg Pro Pro Arg His Glu Asp Gly His Cys Ser Trp Pro Leu  
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aaggtggata acgccctcca atcgggtaac tcccaggaga gtgtcacaga gcaggacagc 180

aaggacagca cctacagcct cagcagcacc ctgacgctga gcaaagcaga ctacgagaaa 240

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<210> 58

<211> 108

<212> PRT

<213> Homo sapiens

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His Met Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp  
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Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn  
20 25 30

Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu  
35 40 45

Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp  
50 55 60

Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr  
65 70 75 80

Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser  
85 90 95

Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys  
100 105